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ABSTRACT

A study examined preschoolers' metacognitive self-regulatory behaviors. It was hypothesized that tasks that omitted or greatly decreased verbalization would allow preschool children to exhibit evidence of metacognitive self-regulatory behaviors. Subjects were 20 preschool children, half identified as special needs and half designated as typical students. Self-regulatory behaviors documented for analysis included: (1) subvocalization during exposure to models the child was to reproduce; (2) task-relevant processing verbalizations made during the execution of a task; (3) questions that related to the execution of the task; (4) behaviors indicating the child was organizing an approach to the tasks; and (5) automatic self-corrections of performance when the child saw the models a second time. Results indicated that while both types of subjects exhibited a variety of metacognitive self-regulatory behaviors, the typical subjects exhibited significantly more of them than the special needs children. The finding of self-regulatory behaviors in preschoolers is contrary to the traditional deficit characterization of the metacognitive abilities of preschoolers and supports the idea of a developmental continuum in the emergence of metacognitive competence. Tables of data and 10 references are included. (HTH)

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Self-Regulatory Behaviors in Preschool Children: Fact or Fantasy?

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Abstract

The present study explored metacognitive self-regulatory behaviors in typical and special needs preschool children. It was hypothesized that selection of tasks that omitted or greatly decreased verbalization would allow preschool children to exhibit other types of evidence of metacognitive self-regulatory behaviors. Results indicated the presence of such behaviors in typical and special needs preschool children. While both typical and atypical preschoolers exhibited a variety of metacognitive self-regulatory behaviors, typical children exhibited significantly more metacognitive behaviors (M=67.5, SD=6.64) than special needs children (M=55, SD=6.96). These results are discussed as preliminary evidence of metacognitive self-regulatory behaviors in preschool children. Of greatest importance is the presence of a continuum of such behaviors in both special needs and typical preschool children.

The malleability of young children is agreed upon among educators and developmental psychologists, however the appropriate means of assessing the changing abilities of young children has been debated considerably. Public Law 99-457 (1986) and Public Law 94-142 (1975) provide an imperative to take a closer look at the way professionals assess the needs of young children.

Typically, young children's cognitive abilities have been seen from a deficit perspective, primarily because models of cognitive development are downward extensions of adult or older child models (Gelman, 1979). For professionals to help children realize their educational potential, they must reframe their conceptualizations of how young children think, problem-solve, learn and develop. One important aspect of children's cognitive functioning is self-regulatory behavior or cognitive monitoring.

Self-regulatory behavior related to cognition is described as dynamic, evolving (not necessarily subject to conscious control), and existing on a continuum from automatic to deliberate (Baker & Brown, 1984; Myers & Paris, 1978). This component is involved in marshalling cognitive resources for performance of a specific task. Self-regulatory behavior incorporates one's overall sensitivity to tasks, and executive routines of analyzing, planning, implementing, monitoring, and revising (Lawson, 1984).

To begin to assess metacognition in the young child, researchers must explore what children can do under favorable performance conditions. Gelman (1979) indicated that "We should study preschoolers in their own right and give up treating them as foils against which to describe the accomplishments of middle childhood" (p. 904). We need to look at the abilities that young

children have, to be on the alert to their competence. Many of the abilities of young children may not be apparent in tasks that we traditionally apply in metacognitive research (Gelman, 1979).

Wellman and Estes (1987) impressed the importance of naturalistic observation as a means to observe strategic activities in very young children as long as the researcher knows what to look for. The use of naturalistic settings is crucial to enhancing evaluation of competence in the performance of young children (Brown et al., 1983; Paris & Lindauer, 1977; Schneider & Pressley, 1989; Wellman & Estes, 1987). This represents a departure from experimental methods that have traditionally been used to research metacognitive abilities. In the investigation of memory activities of young children, Wellman (1988) suggested that one look for evidence of the child's processing task instructions as he interacts with materials, directly observe the child's actions and see if they occur only during memory tasks or whether they generalize to other situations, and watch for evidence that activities indeed aid remembering.

An essential element in the assessment of cognitive and metacognitive abilities is the language proficiency of the child. Language abilities are best assessed within naturalistic contexts such as play (Fewell & Rich, 1987; Genishi & Dyson, 1984; Guralnick & Groom, 1987; Hazen & Black, 1989; Mallory & Kerns, 1988; Menyuk, 1983; Nelson, 1986; Rogers & Lewis, 1989). Fewell and Rich (1987) noted that gestural and orally spoken or expressive language can be indicators of symbolic development, object labeling, and overall communication abilities of young children. Mallory & Kerns (1988) found that

language development problems were a primary reason for referral for assessment and indicated more comprehensive assessment [including play settings] are essential to a thorough assessment of a child's language development and current skills. Activities such as music, art, snack and free-play periods offering choices such as blocks, housekeeping corners and games, provide a rich source for the observation of play to assess language abilities (Guralnick & Groom, 1987).

The primary purpose of this research was to explore and describe the use of cognitive self-regulation in preschool children. Given the current notions that self-regulation develops over time, the present study was designed to observe the possible presence of such behaviors in typical and special needs preschool children. This study was not designed to develop a new instrument, rather to develop a set of tasks that paralleled tasks found in traditional norm-referenced and screening instruments used with preschool children. In addition, the investigators were interested in developing tasks that reduced and or omitted the significant language component traditionally incorporated in metacognitive research. The findings presented here, only represent a portion of a larger study.

Method

Subjects. Subjects included 20 children ages 3 1/2 to 5 1/2 (M=55 months), enrolled in a rural public school preschool program. Half of the subjects were identified as special needs and half of the subjects were designated typical based on state criteria for moderately developmentally

delayed, severely developmentally delayed, and language delayed. Subjects included both sexes (male=13, female=7), various ethnic groups (Hispanic=13, anglo=5, black=2), and a variety of special needs (language delayed=4, language/cognitive delayed=3, severe developmentally delayed=2, quadriplegic cerebral palsy=1). The only attempt to match children was to ensure that typical and special needs children from the same class, and of approximately the same chronological age as their special needs cohort, were included. Subjects were selected on the basis of a language screening which included labeling a series of common toys (20 out of 25 toys labeled in some manner), and answering a series of basic questions (8 out of 11 questions answered in some manner). Children also needed to have the ability to manipulate toys with their hands. Toys and questions were based on items commonly found on traditional preschool assessment instruments and in preschool classrooms. The items used during this screening were one segment of tasks administered in the child's classroom in a play context.

Materials. Experimental materials consisted of one inch blocks, a rotary dial phone and stuffed toys (Big Bird, Cookie Monster, Mickey Mouse, Minnie Mouse, Gobbofraggle, Teddy Bear). The materials were used for three tasks selected for this study to incorporate traditional aspects of assessment tasks, with the addition of components that allowed solicitation and investigation of self-regulatory behaviors or cognitive monitoring in preschool children. The tasks and materials were based on developmentally appropriate abilities, skills and knowledge generally associated with readiness for kindergarten, and modifications of tasks traditionally used in

the cognitive psychology research literature.

Three specific tasks were the focus of the present investigation. These tasks included a block sequencing recall task, block building and a number recall task with a novel approach. One inch cubes were used for the block sequencing and block building tasks. An occluder was also required for both tasks to allow children to see the examiner's model for the 10 second exposure and then hide the model from the children. The number recall task was placed in the context of the children remembering the "phone numbers" needed to call common stuffed toys and ask them to come out and play. Number sequences of two to six digits were administered in ascending order depending on the child's performance on each item.

Procedures. The identified tasks were carried out in the children's classroom during their regular preschool day. Administration of the tasks in the child's classroom provided a familiar setting and the presence of familiar adults, peers and materials, which tend to enhance the overall performance of preschool children (Bergen, 1988; Rubin, Fein, & Vandenberg, 1983). All sessions were videotaped for later analysis, with each task incorporated as a portion of separate sessions. Each child participated in all three tasks. Videotapes were viewed by two independent raters and coded for self-regulatory behaviors (95% interrater agreement). The following examples of self-regulatory behaviors were documented for analysis: (a) subvocalization during the 10 second exposure to models the child was to reproduce; (b) the number of task relevant processing verbalizations the child made during execution of the tasks; (c) the number of questions the child asked related to execution of the

tasks; (d) the number of occurrences of behaviors that indicated the child was organizing an approach to the tasks; (e) the number of times the child glanced back and forth between their [the subject's] materials and the examiner's materials; (f) automatic self-corrections of performance upon seeing the models once they were revealed again; and (g) recognition and/or removal of extraneous materials while reproducing models. These behaviors all concur with existing literature, and are considered to constitute samples of cognitive monitoring behaviors.

Results

Performance on the three tasks that were conducted in the children's classroom in a play context was the focus of the present study. In addition to issues of the number of self-regulatory behaviors, the investigators were also interested in potential differences between special needs and typical preschool children. Table 1 presents Samples of Self-Regulatory Behaviors. Table 2 presents Mean Numbers of Self-Regulatory Behaviors by Student Type. Table 3 presents Mean Numbers of Self-Regulatory Behaviors by Task. An Analysis of Variance (ANOVA) was conducted on composite self-regulatory behavior frequencies for the three tasks included in this study. The results of the ANOVA are presented in Table 4. Significant differences were found within type of student [$F(1,54)=12.224$, $p=.001$)] and within tasks [$F(2,54)=88.768$, $p<.001$]. The interaction effect of type of student and task was not significant [$F=1.1174$, N.S.]. Significantly more [$t(18)=4.110$, $p=.001$] self-regulatory behaviors were observed for typical children ($M=67.5$,

SD=6.64) than for atypical children (M=55, SD=6.96). The differences in the number of self-regulatory behaviors for tasks were due to relatively few self-regulatory behaviors for the recall task (M=4.3) with considerably more behaviors noted for the block building (M=29.2) and the block sequencing (M=25.6) tasks.

Discussion

The present preliminary research explored the presence of metacognitive self-regulatory behaviors in typical and special needs preschool children. It was hypothesized that selection of tasks that omitted or greatly decreased the need for verbalization would allow preschool children to exhibit evidence of metacognitive self-regulatory behaviors. This finding is contrary to a traditional deficit characterization of the metacognitive abilities of preschool children. The presence of these behaviors in typical and special needs preschool children is consistent with a developmental continuum in the emergence of metacognitive competence.

Although these results are consistent with predictions made on the basis of the hypothesis that the reduction of the need for verbalization during task execution would allow for the emergence of metacognitive self-regulatory behaviors, some cautions are in order. Definitions of metacognitive self-regulation for purposes of this investigation differ somewhat from traditional behaviors given the age and developmental abilities of the subjects, which suggests a reframing of traditional approaches to the study of metacognition. The use of the classroom play setting as the context for performance

existing research which has documented the increased performance of young children in familiar settings. The finding also supports the importance of continuing to work with young children in naturalistic and familiar settings.

Table 1

Samples of Self-Regulatory Behaviors

Subvocalizations

Saying numbers after the examiner, and before repeating them.

Verbalizations:

Did not include:

Answers to direct questions by the examiner

Comments unrelated to the immediate task

Did include:

"I'm making a line." (reference to block building)

"That's easy!"

"I need another one."

"I don't think I did this right."

"I'm done." or "I'm finished."

Naming colors

Counting blocks

Repeating numbers

Asking Questions

"Did I use this one?"

"Can I see that again?"

"How many are there?"

Organized Approach

Counting the blocks in the model

Counting the blocks in their own structures

Table 1 (continued)

Samples of Self-Regulatory Behaviors

Working from right to left or left to right

Placing one block at a time.

Glance Back and Forth

Between model and own blocks

Between model and examiner, waiting for cue

Between model and own blocks before building

Self-Corrections

Usually occurred after seeing the model

Too many blocks

Too few blocks

Extra Materials

Credit given for ignoring extra blocks

Table 2

Mean Number of Self-Regulatory Behaviors by Student Type

Behavior	Atypical	Typical
Subvocalization	2.00	1.50
Verbalization	3.90	4.80
Asking Questions	1.70	2.40
Organized Approach	5.00	5.90
Glancing Back and Forth	9.90	11.90
Self-Corrections	2.60	3.10
Ignored Extra Materials	3.60	4.00

Table 3

Mean Number of Self-Regulatory Behaviors by Task

Behavior	Number Recall	Block Building	Block Sequencing
Subvocalization	2.00	1.13	2.17
Verbalization	3.00	5.00	4.59
Asking Questions	3.20	1.50	1.75
Organized Approach	4.13 (max=6)	7.05 (max=8)	4.50 (max=5)
Glancing Back and Forth	NA	10.85	10.90
Self-Corrections	NA	2.20	3.20
Ignored Extra Materials	NA	5.39 (max=9)	2.17 (max=3)

Table 4

ANOVA Findings

Source	SS	Df	MS	F-Ratio	p
Student Type	498.82	1	498.82	12.24	.001
Task	7232.63	2	3616.32	88.77	.000
Student Type X Task	95.63	2	47.82	1.17	.317
Residual	2200.68	54	40.75		

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